ABSTRACT

The invention relates to the field of engineering physics, in particular, to the radiation detection technique.

The technical object to be attained is to increase sensitivity and accuracy in detecting radiation intensity, as well as to expand a dynamic range of radiation intensities to be detected.

The first embodiment of the radiation detector comprises a series-connected photodiode and a load, with the load being coupled with the photodiode through a signal contact and at the other side being connected to a common bus. The detector additionally comprises a transistor and an interrogation pulse generator, with the second photodiode electrode being coupled with the first electrode of the transistor, a control electrode of which is coupled with the interrogation pulse generator output, and the third transistor electrode being coupled with the common bus. Besides, N groups of elements, each consisting of the series-connected photodiode and transistor, may be placed in parallel with the load, and the interrogation pulse generator comprises N outputs, each being coupled with the transistor control electrode from the respective group of elements, where N is an integer > 1. Besides, the radiation detector may comprise L loads, where L is an integer >1. The total number of groups of elements equals the number of outputs of the interrogation pulse generator.

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(Alternatively, capacitors may be placed in parallel with the photodiodes).

The second embodiment of the radiation detector comprises a radiation-sensitive element and a load, with the sensitive element being connected at one side to a voltage supply bus and the load being connected at one side to a common bus. The detector additionally comprises a transistor, a capacitor and an interrogation pulse generator, with the sensitive element being connected at the other side to the first transistor electrode and the first plate of the capacitor, the second plate of which is connected to the load signal contact, and the output of the interrogation pulse generator being connected to the control electrode of the transistor, the third electrode of which is connected to the common bus. Besides, N groups of elements, each consisting of the series-connected sensitive element and transistor, the common point of which is connected to the load signal contact via the capacitor, may be connected between the supply voltage bus and the common bus, and the interrogation pulse generator comprises N outputs, each being connected to the transistor control electrode from the respective group of elements, where N is an integer > 1. Besides, the radiation detector may comprise L loads, where L is an integer >1. In this case, the total number of groups of elements equals the number of outputs of the interrogation pulse generator. Besides, resistors

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may be connected between the sensitive elements and the common point of the transistors and capacitors.

The third embodiment of the radiation detector comprises a radiation-sensitive element and a load, with the sensitive element being connected at one side to a supply voltage bus and the load being connected at one side to a common bus. The detector additionally comprises a transistor and an interrogation pulse generator, with the sensitive element being connected at the other side to the first transistor electrode, the output of the interrogation pulse generator being connected to the control electrode of the transistor, the third electrode of which is connected to the load signal contact. (Additionally, a capacitor may be connected between the first transistor electrode and common bus, and a resistor may be connected between the first transistor electrode and sensitive element). 11 claims, 9 illustrations.

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